Electric Actuators with Process Controllers
TROVIS 5724-3 (without fail-safe action)
TROVIS 5725-3 (with fail-safe action)

for domestic hot water heating

Application

Electric actuator with integrated digital controller for heating, ventilation and air-conditioning systems. For globe and three-way valves, e.g. Types 3213, 3214, 3260, 3222 or 3226 Valves in nominal sizes DN 15 to 50.

CE

The TROVIS 5724-3 and TROVIS 5725-3 are a combination of an electric actuator and an integrated digital controller. They are especially designed for DHW heating in instantaneous heating systems for small to medium-sized buildings and for fixed set point control circuits in mechanical engineering applications. They are particularly suitable for mounting to SAMSON Types 3213, 3214, 3260, 3222 and 3226 Valves.

The TROVIS 5724-3 Actuator is without fail-safe action and TROVIS 5725-3 with fail-safe action. The TROVIS 5724-3 has a manual override to manually move the valve in the de-energized state.

Special features

- Control using two different set points, e.g. DHW temperature and DHW temperature for thermal disinfection.
- Manual setting possible at the set point potentiometer or over TROVIS-VIEW software
- Function to maintain water temperature constant, preventing the heat exchanger from cooling down between tapping
- Pump output to control a circulation pump can alternatively be used as a fault alarm output
- Direction of action reversible:
  - Globe valve opens when the actuator stem retracts (increasing/increasing)
  - Three-way mixing valve mixes/diverts the flow(s) when the actuator stem extends (increasing/decreasing)
- Limit value monitoring:
  - The valve is closed by the actuator when the maximum adjustable limit value is exceeded
  - The frost protection function is started when the temperature falls below the minimum adjustable limit
- Configuration, parameterization, diagnostic function and direct connection for monitoring over TROVIS-VIEW software
  - Direct data transmission using a connecting cable (direct connection to PC)
  - Data transmission using a memory pen

Fig. 1: *TROVIS 5724-3 Electric Actuator with Process Controller*

Typetested version

The TROVIS 5725-3 Electric Actuator with Process Controller is tested in the force-locking version together with various SAMSON valves by the German Technical Inspectorate (TÜV) according to DIN EN 14597. Register number available on request.

Note: Refer to Data Sheets ▶ T 5868, ▶ T 5869, ▶ T 5861, ▶ T 5866, and ▶ T 5863 for details on Types 3213, 3214, 3260, 3222, and 3226 Valves.

Accessories

- TROVIS-VIEW configuration software for TROVIS 5724-3 /5725-3 Electric Actuator with Process Controller
- Hardware package with a memory pen-64, a connecting cable and a modular adapter (order no. 1400-9998)
- Memory pen-64 (order no. 1400-9753)
- Type 5207-0060 Pt 1000 Sensor
- Sensor pocket (order no. 1400-9249)
- Water flow sensor with extension cable with mating connector (order no. 1400-9246)

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Principle of operation

The actuator consists of a digital controller which is integrated into the electric actuator housing. The digital controller is connected to a temperature sensor on the input side which can be optionally upgraded by a water flow sensor or a flow switch.

The set point of the digital controller can be set manually or with the help of the TROVIS-VIEW configuration software.

The actuator contains a reversible synchronous motor and a maintenance-free gear. The motor is switched off by torque-dependent switches when an end position is reached or in case of overload. The force of the electric motor is transmitted via gearing and crank disk to the actuator stem (3) and to the plug stem of the mounted valve. When the actuator stem extends, it presses on the plug stem (10) of the valve. When the actuator stem retracts, the plug stem follows the movement of the return spring in the valve. Actuator and valve are connected by the coupling nut (4).

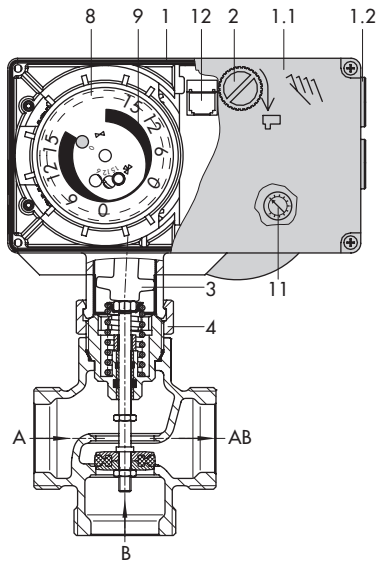
TROVIS 5724-3

The electric actuator **without fail-safe action** has a handwheel (2) used to manually position the valve (only when the actuator is disconnected from the power supply). Travel and direction of action can be read off the travel indication scale (9) on the side of the actuator housing.

TROVIS 5725-3

The electric actuator **with fail-safe action** is basically the same as TROVIS 5724-3. However, it contains a spring assembly (8) and an electromagnet which in de-energized state move the connected valve to the appropriate fail-safe position. The TROVIS 5725-3 Actuator is only available with fail-safe action "Actuator stem extends".

A handwheel (2) is not fitted. On disconnecting the actuator from the power supply and removing the housing cover (1.1), manual override is possible using an Allen key. As soon as the Allen key is released, the actuator immediately moves back to its original position.



1 Electric actuator with process controller
1.1 Housing cover
1.2 Cable entry
2 Handwheel (TROVIS 5724-3 only)
3 Actuator stem
4 Coupling nut
8 Spring assembly (TROVIS 5725-3 only)
9 Travel indication scale
10 Plug stem
11 Set point potentiometer
12 Serial interface (RJ-12 jack)

Fig. 2: *Functional diagram*

Electrical equipment

The actuator requires a Pt 1000 temperature sensor (e.g. Type 5207-0060) to be connected for it to function. Alternatively, a sensor with an mA signal can be used for mechanical engineering applications.

The fast-responding Pt 1000 sensor allows the temperature to be controlled to the set point almost immediately. The set point default setting is 60 °C. It can be adjusted between 10 and 100 °C over the integrated potentiometer. It can also be changed over the TROVIS-VIEW software connected at the RS-232 interface.

Option to improve control accuracy in small installations

The use of the Type 5207-0060 Pt 1000 Sensor is recommended in conjunction with a sensor pocket to provide the best positioning of the temperature sensor at the heat exchanger.

In addition, a water flow sensor or a flow switch can be connected to quickly recognize when hot water is being tapped or to improve the control accuracy even further.

A hot water circulation circuit improves the control accuracy considerably.

Switching output

The switching output can be configured as either a pump output (circulation pump for the DHW circuit or heating circuit), a fault alarm output or an output to report when hot water is tapped.

Mounting

Prior to mounting the actuator on the valve, retract the actuator stem. In order to retract the actuator stem of TROVIS 5725-3, remove the housing cover, retract and retain the actuator stem by turning the actuating shaft counterclockwise using a 4 mm Allen key. The coupling nut may only be tightened after the stem has been retracted.

Mounting position

The control valve can be installed in the pipeline in any desired position. However, a suspended mounting position of the actuator is not permissible (see Fig. 3).

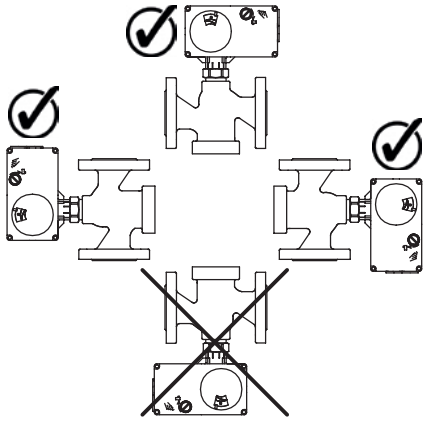
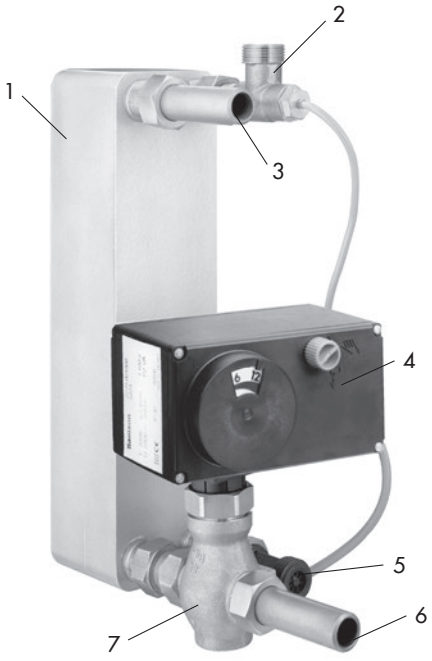


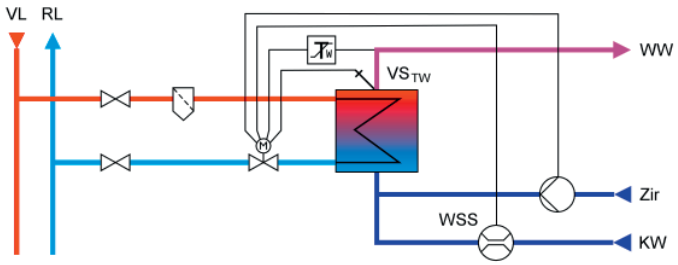
Fig. 3: *Mounting position* [1)]

1) The degree of protection IP 54 can only be achieved up to device index .03 when the actuator is installed in the upright position. See last two figures of the configuration ID (Var.-ID) written on the nameplate.

Type 5207-0060 Pt 1000 Sensor · Optimized temperature sensor with fast response which is simple to install	
Connection	Wire ends fitted with wire end ferrules including plastic sleeves
Connecting cable	PVC, 2000 mm long
Perm. ambient temperature	–5 to 80 °C
Perm. medium temperature	–5 to 90 °C
Mechanical connection	Stainless steel (1.4404)
Protective tubing	Stainless steel (1.4404)
Time response	$t_{0.5}$ < 1 s · $t_{0.9}$ < 3 s, 0.4 m/s in water
Thread length	52 mm
Nominal pressure	PN 16
Sensor pocket (order no. 1400-9249) · For Type 5207-0060 Pt 1000 Sensor for mounting on the heat exchanger, to provide the best positioning in DHW heating in instantaneous heating systems	
Material	Red brass CC491K (2.1096.01)
Mechanical connection	
G ¾ male thread	Pipe connection for ½" pipe
Female thread, G ¼	Sensor connection
Coupling nut, G ¾	Heat exchanger connection
Nominal pressure	PN 16

Water flow sensor with extension cable (order no. 1400-9246) Axial turbine flowmeter for liquids	
Measuring range	1 to 30 l/min
Measuring accuracy	1 % of upper measuring range value
Mechanical connection	G ¾ male thread
Nominal size	DN 10
Nominal pressure	PN 10
Max. medium temperature	70 °C, briefly 90 °C
Power supply	4.5 to 24 V DC
Degree of protection	IP 54
Electrical connection	3 single wires with connector (JST) approx. 150 mm long
Sensor	Hall effect sensor
Pressure loss	0.25 bar at 15 l/min
Pipe socket/vane wheel	PPO Noryl





VL Flow pipe
RL Return flow pipe
WW Hot water
KW Cold water
Zir Circulation pipe
VS_{TW} Flow sensor
WSS Water flow sensor

1 Heat exchanger
2 Type 5207-0060 Temperature Sensor incl. sensor pocket (1400-9249), VS_{TW}
3 Supply from district heating network (VL)
4 TROVIS 5724-3/5725-3 Electric Actuator with Process Controller
5 Water flow sensor with extension cable (1400-9246)
6 Return flow to district heating network (RL)
7 Valve, e.g. Type 3222
8 Safety temperature monitor, e.g. Type 5313 (only in combination with TROVIS 5725-3)

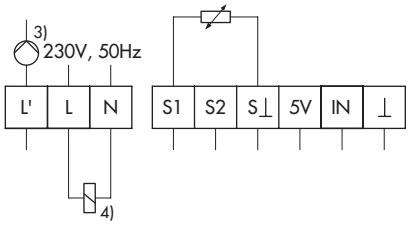
Fig. 4: *DHW heating in instantaneous heating system, typical application with TROVIS 5724-3/5725-3*

Technical data

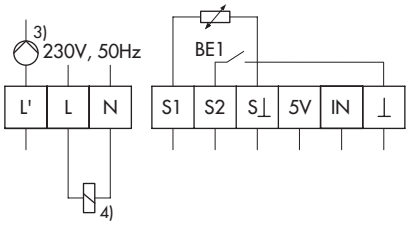
TROVIS ... Actuator	5724						5725					
	-310	-313	-320	-323	-330	-333	-310	-313	-320	-323	-330	-333
Fail-safe action	Without						With					
Connection to valve	Force-locking				Form-fit		Force-locking				Form-fit	
Rated travel	6 mm	6 mm	12 mm	12 mm	15 mm	15 mm	6 mm	6 mm	12 mm	12 mm	15 mm	15 mm
Transit time for rated travel	35 s	18 s	70 s	36 s	90 s	45 s	35 s	18 s	70 s	36 s	90 s	45 s
Transit time for fail-safe action	–						4 s		6 s		7 s	
Fail-safe action, stem	–						Extends					
Nominal thrust	700 N						500 N				280 N	
Power supply	230 V (10 %), 50 Hz						230 V (10 %), 50 Hz					
Power consumption, approx.	4 VA	7.7 VA	4 VA	7.7 VA	4 VA	7.7 VA	5.5 VA	9.2 VA	5.5 VA	9.2 VA	5.5 VA	9.2 VA
Manual override	Yes						Possible [1]					
Permissible temperatures [5]												
Ambient	0 to 50 °C						0 to 50 °C					
Storage	–20 to 70 °C						–20 to 70 °C					
Perm. temperature at the actuator stem	0 to 135 °C						0 to 135 °C					
Degree of protection	IP 54 [4]						IP 54 [4]					
Electromagnetic compatibility	Acc. to EN 61000-6-2, EN 61000-6-3 and EN 61326											
Weight	Approx. 1.1 kg						Approx. 1.3 kg					
Compliance	CE · EAC											
Binary input BE1 [3]	Floating contact for internal set point switchover or to deactivate that the temperature is maintained constant in the heat exchanger											
Binary input BE2 [3]	Floating contact to connect a flow switch											
Switching output	230 V/50 Hz, max. 1 A											
Accessories												
Temperature sensor	Pt 1000											
Water flow sensor	530 pulses/l											
Flow switch	Yes [2] · Alternative to water flow sensor											

1) Manual override using a 4 mm Allen key (after removing the housing cover), always returns to fail-safe position after release.
2) The flow switch or water flow sensor is not required in DHW heating in instantaneous systems with a constant circulation.
3) Recommendation: Use devices with gold contacts when using relays
4) Only when installed in the upright position up to device index **.03**.
See last two figures of the configuration ID (Var.-ID) written on the nameplate, e.g. Var.-ID xxxxxx.**xx**, for the device index.
5) The permissible medium temperature depends on the valve on which the electric actuator is mounted. The limits specified in the valve documentation apply.

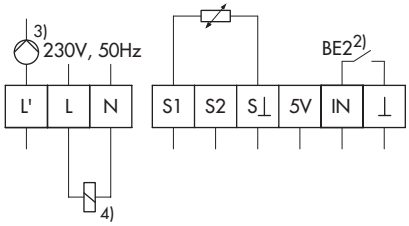
DHW heating in instantaneous heating system



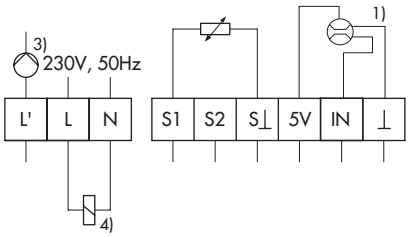
Operation with Pt 1000 sensor



Operation with Pt 1000 sensor and binary contact
to switch between set points

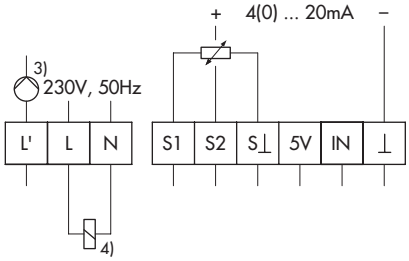


Operation with Pt 1000 sensor and flow switch

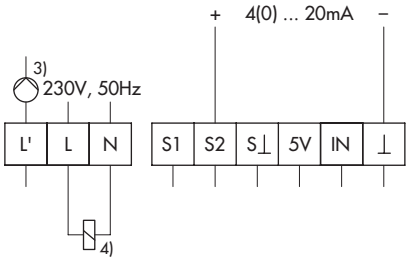


Operation with Pt 1000 sensor and water flow sensor
(refer to Fig. 5 for information on connection of water flow sensor)

Mechanical engineering applications



Operation with Pt 1000 sensor and set point over current input



Operation with current input

1) Water flow sensor
2) Flow switch
3) Pump control/fault indication output
4) Electromagnet (TROVIS 5725-3 only)

Information on connection of water flow sensor

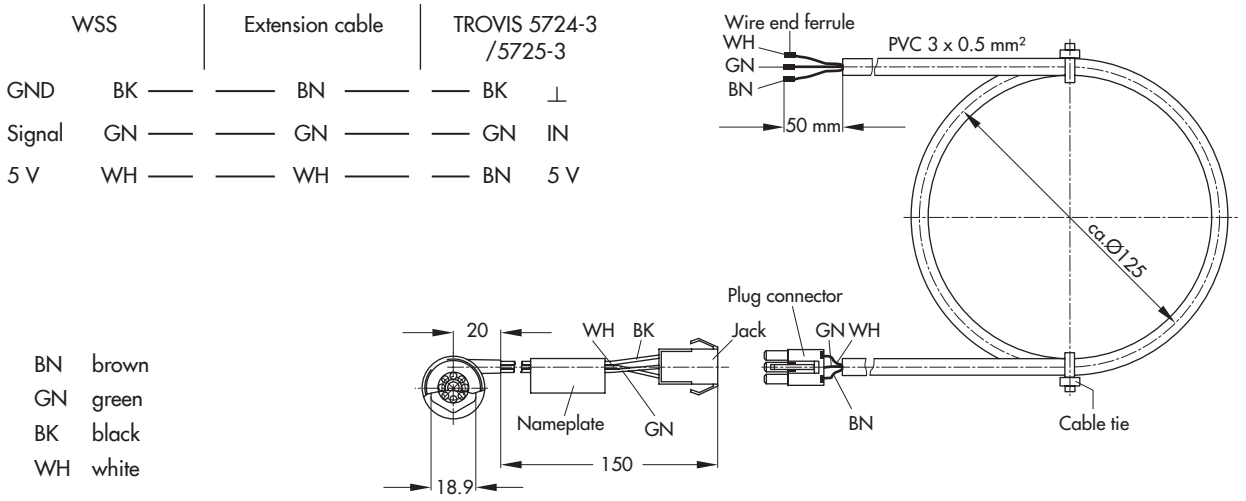
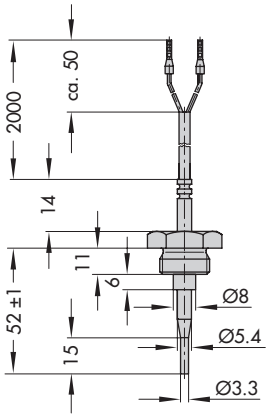
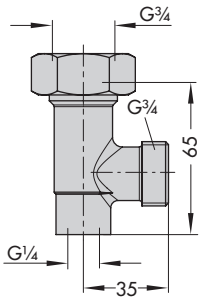


Fig. 5: *Connection of water flow sensor (WWS)*

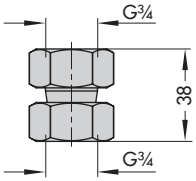
Dimensions in mm · Accessories



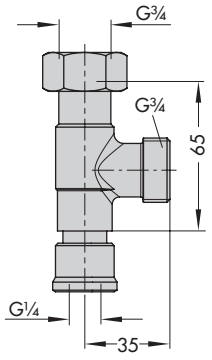
Type 5207-0060 Temperature Sensor (Pt 1000)



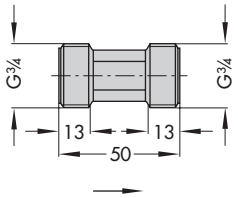
Sensor pocket (incl. gasket) for heat exchanger with G ¾ (order no. 1400-9249)



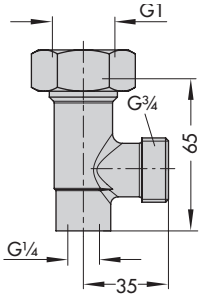
Connecting piece (incl. gasket) for valve G ¾ (order no. 1400-9236)



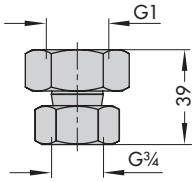
Circulation circuit connection (incl. gasket) (order no. 1400-9232)



Water flow sensor with extension cable (order no. 1400-9246)

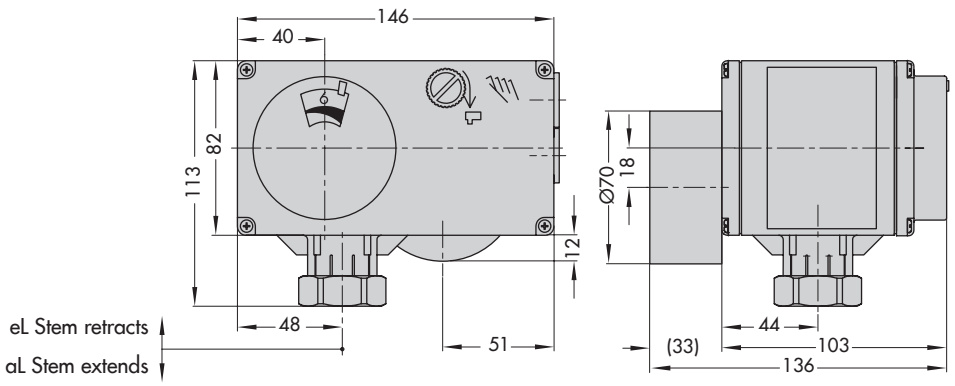


Sensor pocket (incl. gasket) for heat exchanger with G 1 (order no. 1400-9252)

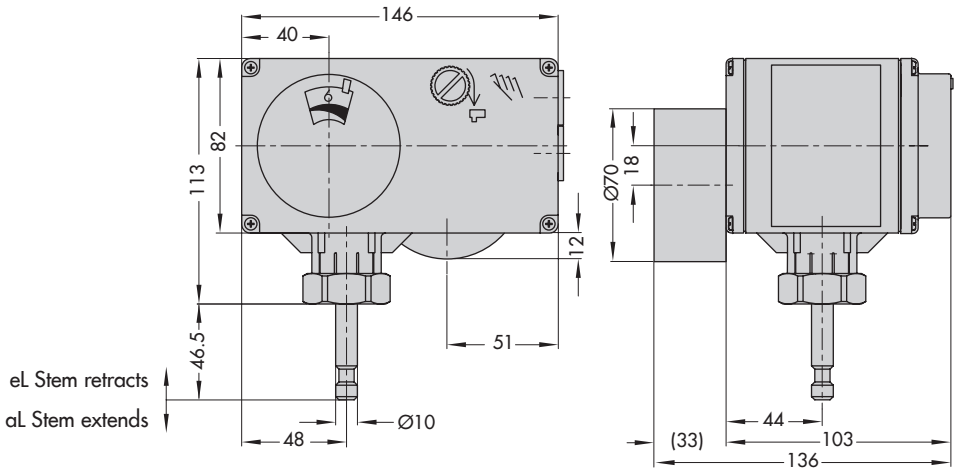


Connecting piece (incl. gasket) for valve G 1 (order no. 1400-9237)

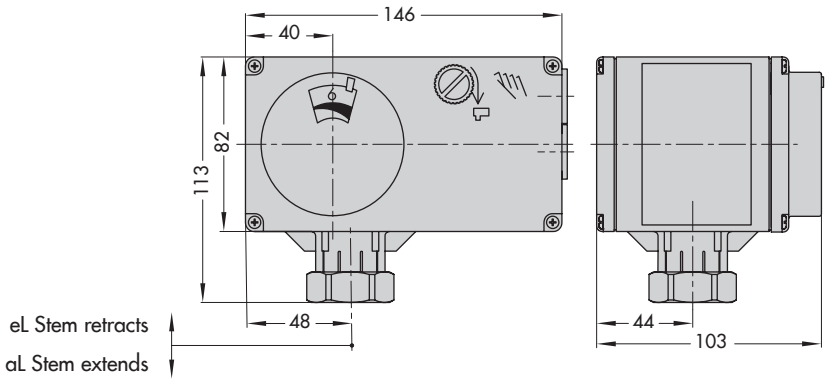
TROVIS 5724-313/-323
TROVIS 5725-313/-323



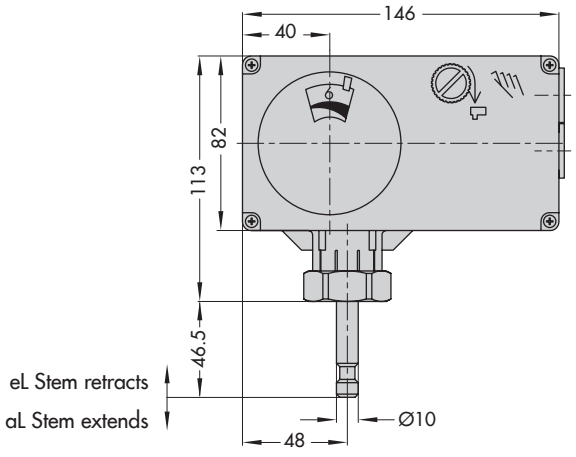
TROVIS 5724-333
TROVIS 5725-333



TROVIS 5724-310/-320
TROVIS 5725-310/-320



TROVIS 5724-330
TROVIS 5725-330



Ordering text

Electric Actuator with Process Controller

TROVIS 5724-3 without fail-safe action/TROVIS 5725-3 with fail-safe action

Closing force … N

Valve travel … mm

Power supply 230 V/50 Hz

Specifications subject to change without notice

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